

PATENT

Attorney Docket No.: AMAT/2286.C2/CPES/DT/PJS

Express Mail No.:EV335477814US

**ABSTRACT**

The present invention generally provides a precleaning process prior to metallization for submicron features on substrates. The method includes cleaning the submicron features with radicals from a plasma of a reactive gas such as oxygen, a mixture of  $\text{CF}_4/\text{O}_2$ , or a mixture of  $\text{He}/\text{NF}_3$ , wherein the plasma is preferably generated by a remote plasma source and the radicals are delivered to a chamber in which the substrate is disposed. Native oxides remaining in the submicron features are preferably reduced in a second step by treatment with radicals from a plasma containing hydrogen. Following the first or both precleaning steps, the features can be filled with metal by available metallization techniques which typically include depositing a barrier/liner layer on exposed dielectric surfaces prior to deposition of aluminum, copper, or tungsten. The precleaning and metallization steps can be conducted on available integrated processing platforms.